



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE

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Dr. Joshua Lederberg
Professor of Genetics
Department of Genetics
Stanford University Medical School
Palo Alto, California

Dear Dr. Lederberg:

I was interested in your exchanges concerning recombinations of virus and host genetic material with Dr. Bryan. It bears on a subject in which I have had a keen interest for some time - the possibility of creating oncogenic viruses out of non-oncogenic viruses.

There is one "human" virus system that might be considered. Of 28 adeno-virus serotypes, only two (types 12 and 18) have been found to have oncogenic effects in hamsters (see enclosed paper). These two serotypes have two distinct properties (markers?) in common besides hamster oncogenicity; they each elaborate a specific instead of a (common) CF antibody in hamsters, and only in those developing tumors. The antigen also appears to be heat labile; the common antigen is heat stable. They are the only two which lack hemagglutinins. The possibility of a linkage of these properties with the property of oncogenicity, which is also unique, exists and should be explored.

In addition, since the majority of adenoviruses (including the most common ones) do not have the hamster oncogenic property, it is possible to think that this property in several strains of type 12 and the type 18 prototype is the result of a recombination process some time in the past of a stem virus for both type 12 and type 18 with the genetic material of a cancer cell (probably human, possibly animal), in the course of which it lost certain other properties (such as the ability to hemagglutinate).

Transduction seems to me the best explanation of most viral oncogenesis, and a conscious effort to produce experimentally cancer viruses a worthwhile effort. The Berry-Dedrick reaction between oncogenic and non-oncogenic representatives represents one type of approach, but another would be "forced feeding" of viruses in "cancer" cells both in vivo and in vitro.

Sincerely,

Robert J. Huebner, M.D., Chief
Laboratory of Infectious Diseases
National Institute of Allergy and
Infectious Diseases

Enclosure

Huebner - NIH